REMARKS

This Amendment is submitted in response to the Office Action mailed on December 31, 2003. Claims 1 - 30 are pending. Claims 23 - 30 are allowed. Claims 3 and 4 would be allowable if re-written in independent form. Claim 3 has been so re-written, and claim 4 has been implicitly re-written, because it depends from claim 3.

Claims 31 - 33 are added.

A check for $ 140.00 ($ 86.00 + 54.00) is enclosed to cover the fee for the added independent claim and three dependent claims.

Claims 1, 2, and 5 - 22 are rejected.

RESPONSE TO CLAIM REJECTIONS

All claims were rejected on grounds of anticipation, based on Perkins.

Claim 1

Claim 1 recites:

> 1. A method of operating a packet-switched network, comprising the following steps:
>
> a) at each node, repeatedly examining status of links connecting to the node; and
>
> b) if a change in status is detected by a node, flooding the network with news of the change in messages which are self-propagating

and self-terminating.

Claim 1(b) states that the messages are "self-propagating." The Office Action, page 2, last paragraph, interprets "self-propagating" as meaning that the messages lack stated destinations.

However,

-- Perkins **explicitly states** that his messages contain destinations;

-- Applicant submits that, because Perkins uses a wireless network, he requires stated destinations, and

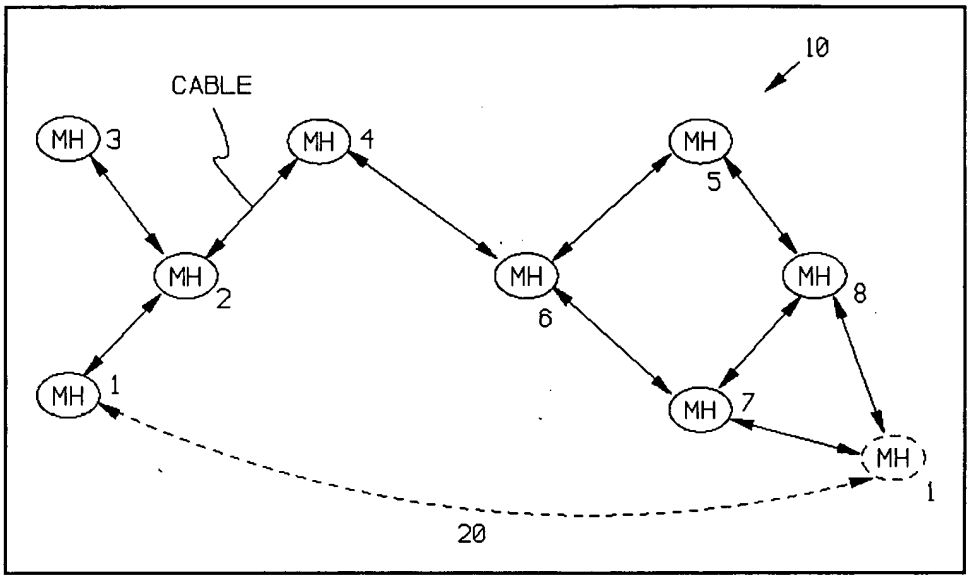
-- Perkins states that he uses the "IP" (Internet Protocol) approach, which requires that messages contain addresses (ie, stated destinations).

These three points will be explained. But Perkins will first be explained, to the extent that the undersigned attorney can understand that reference.

Perkins Reference

This reference is found to be highly cryptic, and is interpreted as follows. Perkins' Figure 2 shows mobile hosts MH, which are mobile computers, as used on a battlefield. (Column 1, line 20 and line 64 et seq.) Sketch 1, below, is a rendition of

that Figure. The double arrows indicate communication links between pairs of mobile hosts MH.



Sketch 1

Each mobile host is equipped with a "routing table." Perkins shows a routing table at the bottom of his column 9, and it corresponds to Sketch 1, above. That routing table applies to mobile host 4, MH4.

The first row, first two columns, indicate that, when MH4 receives a message addressed to "Destination" MH1, the "NextHop" is MH2. That means that MH4 transmits the message to MH2 when MH4 receives the message. MH2 contains its own routing table, which tells it the next hop from MH2 to MH1.

The third column ("Metric") means that two hops are required

from MH4 to the destination of MH1, consistent with Sketch 1. ("Metric" means the number of hops: column 5, lines 23 - 25; column 7, lines 3 - 5.) Every other MH contains its own routing table.

That is the basic idea behind the routing tables.

The mobile hosts MH will constantly move around, so that, for example, mobile host 1 may move along the dashed path 20. Prior to movement, mobile host 1 could connect with mobile host 2. But, after the movement, mobile host 1 now has gone out-of-range from mobile host 2, and is now within range of mobile hosts 7 and 8. This movement creates a need to modify the routing tables to reflect the new network topology. (Perkins' Summary of the Invention, third paragraph.)

These modifications of Perkins include the following processes. When a mobile host MH learns that a neighbor has gone out-of-range, that MH assigns a value of infinity to the metric for that neighbor. (That is, the number of hops to reach that neighbor is considered infinite. Column 7, lines 25 - 27. Perkins calls this a "broken link." Ibid.)

That fact is immediately broadcast to other mobile hosts MH. (Column 7, lines 30 - 33.) Messages are generated by the mobile host learns the absence of the out-of-range neighbor, and are transmitted to the other mobile hosts MH, so that they can update their routing tables.

Perkins states that the messages contain addresses. That is,

the messages concerning broken links are transmitted to individual recipients, and one message is addressed to each mobile host MH. (Column 5, lines 1 - 10.)

Perkins, column 6, lines 12 - 44, contains a confusing discussion. He states that certain messages contain an "actual destination," but are addressed to a neighbor of an MH. Upon receipt of the message, the neighbor locates the "actual destination," and re-addresses the message. The undersigned attorney does not understand why

1) the message does not simply display the address of the destination and

2) the neighbor does not simply relay the message to that destination, using the neighbor's routing table.

In any event, it is clear that the messages in Perkins which are used to convey information about broken links do contain addresses. Thus, the messages do specify addresses.

Return to the Three Points

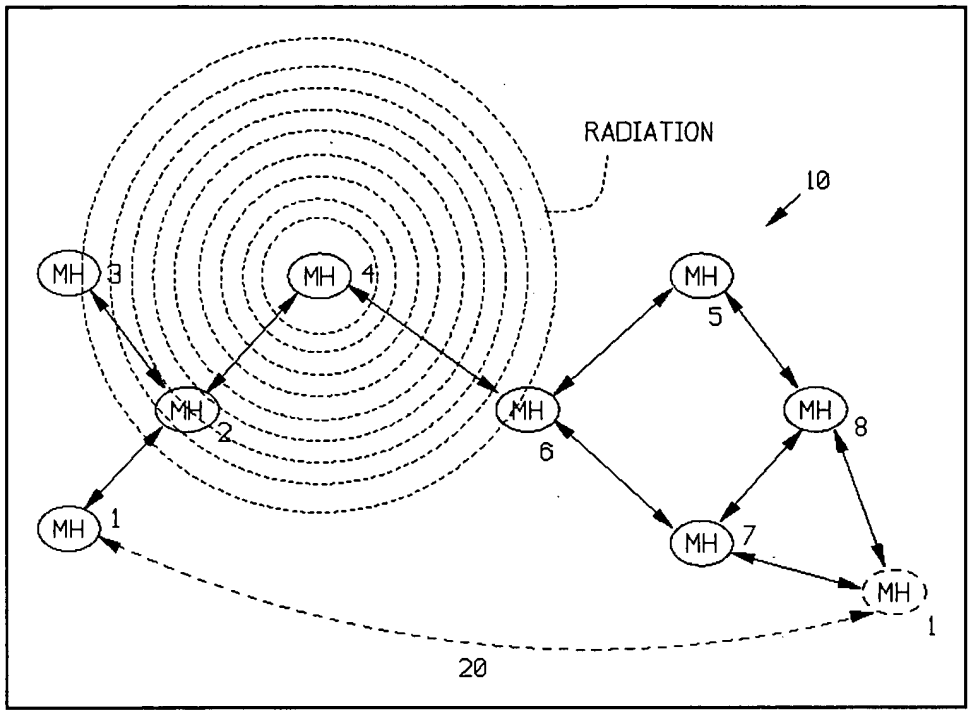
Point 1

The description of Perkins, given above, illustrates that he **explicitly states** that his messages do contain addresses, contrary to the PTO's interpretation of "self-propagating."

Point 2

Applicant submits that Perkins **must** use addresses, because his network is wireless. For example, assume that Sketch 1 shows an ordinary hard-wired network. If mobile host MH2 wished to transmit a message to mobile host MH4, the former would locate the CABLE leading to the latter, and transmit the message on that CABLE. That message would be delivered to MH4, and to nobody else. Thus, as explained at this level, no need for an address exists.

However, as stated above, Perkins' network is **wireless**. No such CABLE exists as in Sketch 1. Instead, mobile host 2 transmits radiation, as illustrated in Sketch 2, below.



Sketch 2

Multiple mobile hosts will receive that message, as indicated. Applicant submits that, for the network to function properly, the message **must** contain a destination address, so that the non-intended mobile hosts can ignore it.

Restated, Applicant submits that it makes no sense to transmit every message to every MH who is able to receive it, without specifying which MH is the intended recipient. Addresses must be used.

Point 3

Perkins states that he uses the IP protocol. (Column 3, lines 37 - 43.) The following discussion of the IP protocol can be found in the Internet at the following address:

http://www.faqs.org/rfcs/rfc791.html

> 1.1. Motivation
>
> The Internet Protocol is designed for use in interconnected systems of packet-switched computer communication networks. Such a system has been called a "catenet" [1]. The internet protocol provides for transmitting blocks of data called datagrams from sources to destinations,
>
> **where sources and destinations are hosts identified by fixed length addresses.**
>
> The internet protocol also provides for fragmentation and reassembly of long datagrams, if necessary, for transmission through "small packet" networks.

Interim Conclusion

Therefore, Applicant submits that Perkins **does not** show the "messages lacking stated addresses" as the PTO interprets claim 1 to state.

re: "Self-Terminating" Messages

The PTO states that the fact that Perkins discards messages having older time stamps shows the "self-terminating" messages.

However, Applicant points to several apparent problems with this assertion.

One is that what Perkins discards are not "messages." Rather, the items which he discards are data previously stored in the routing tables.

A second problem is that, even if those items are considered as "messages," they do not correspond to the messages of claim 1. Under the language of claim 1, the messages contain "news of the change" in status of a link. If the "message" in Perkins is deleted because of a stale timestamp, that means that the discarded "message" no longer contains valid data. Thus, it does not contain "news of the change." It may contain news of a previous change, but not of "the change" of claim 1.

Re: "Repeatedly Examining Status"

Claim 1(a) recites "at each node, **repeatedly examining status** of links connecting to the node." That is an **active** process. Applicant cannot locate where Perkins shows that, and requests, under 37 CFR §§ 1.104(c)(2) and 35 U.S.C. § 132, that the PTO specifically identify this recitation in Perkins.

It appears that Perkins does something completely different. He states, column 14, lines 4 et seq., that each MH is expected to transmit "regular updates." When those are not received from an MH, it is then concluded that the MH is "no longer a neighbor," and

the link to that neighbor has become broken.

Restated, if an MH fails to receive "regular updates" from a neighbor, that MH assumes that the link to the neighbor has become broken.

But that is not an "examination" of a "link," nor a "repeated" examination.

In fact, Applicant submits that the language of claim 1 does not even apply to this situation. One reason is that the links in Perkins are actually pairs of "one-way streets." One can be operational, and the other not. The non-operability of which Perkins learns does not correspond to the subject matter of claim 1. This will be explained.

For example, a neighboring MH in Perkins could fail to transmit "regular updates" because its battery went low. But the "link" could still be present, because the distance between the two MH's has not changed, and because that MH can still **receive** data.

It is well known that, in general, a radio transceiver may lack sufficient power to **transmit** a message to another transceiver, but can still **receive** that same message from the other transceiver.

Perhaps the simplest explanation is to assume omni-directional antennas, which radiate spherical patterns. The transmitter must expend sufficient energy to fill an entire sphere (or cover its entire surface, depending on how you view the situation) with electromagnetic radiation. However, the receiver

only absorbs an extremely small portion of the radiation, namely, that absorbed by its antenna. The rest is wasted. And the receiver, to operate, does not require the amount of power the transmitted needs to fill the sphere (or surface) with radiation.

Thus, if a receiver has limited power, it may very well be able to **receive** a message, and yet lack the power to **transmit** a message.

Therefore, Applicant submits that the language of claim 1(a) does not apply to Perkins' system. It could happen that a neighboring MH lacks battery power to **transmit** "regular updates," but that this MH can still **receive** data. Thus, the neighboring MH can still receive packets, and relay them to their destination.

To expand this further, Applicant points out that the web page identified above, at page 3, states:

> The internet protocol does not provide a reliable communication facility.
>
> **There are no acknowledgments either end-to-end or hop-by-hop.**
>
> There is no error control for data, only a header checksum.
>
> There are no retransmissions. There is no flow control.

Thus, it seems reasonable to conclude that, in Perkins, even if "regular updates" are not received **from** a neighbor, that does not mean that the link **to** the neighbor is broken.

Consequently, one conclusion is this. In one sense, the IP protocol uses links as one-way streets. That is, the link in question (the one on which "regular updates" are missing) is actually two one-way streets: one running from MH1 to MH2 (for example) and the other running in the opposite direction, from MH2 to MH1.

In Perkins, a failure of MH1 to receive "regular updates" from MH2 would indicate a break in the MH2-to-MH1 link. However, that does not prevent MH1 from using the MH1-to-MH2 link.

Therefore, Perkins does not actually detect a change in status of the relevant link. 'Restated, if Perkins is operating as the web page states (ie, no return data is received on the link) then, clearly, Perkins is not doing what claim 1 recites. That is, if MH1 is the node in question, then MH1 must repeatedly examine the MH1-to-MH2 (for example) link. Perkins does not do that. MH1 only responds to a failure in the MH2-to-MH1 link, when "regular updates" are not received from MH2. But the MH1-to-MH2 link can still be operational.

THEREFORE, if Perkins operates as the web page indicates, he does not perform the detection of claim 1.

-- He responds to the absence of arrival of "regular updates." That is not the claimed "repeatedly examining status . . ."

-- That absence of arrival may result from a

failure in one "street" in the pair of one-way streets within one of his links. That does not correspond to claim 1.

Additional Point

In addition, Applicant submits that, if claim 1(a) is said to be found in Perkins, then that necessarily indicates that Perkins is using addresses (or "stated destinations"), contrary to the PTO's previous assertion.

One reason is that, as explained in connection with Sketch 2, above, each mobile host MH broadcasts radiation which all others (within range) can receive. Applicant asks: How can an MH examine a link, without transmitting a message containing a destination address ? For example, in Sketch 1, MH2 has three links connected to it. How does MH2 determine whether all three links are operational, without specifically sending messages to each of MH1, MH3, and MH4 ?

For instance, assume that MH2 broadcasts a message stating, "If you receive this, answer back with your name." If MH8 receives that message, it will answer by stating something like, "MH8 hears you." But MH8 is not linked to MH2. Thus, MH2 obtains false information.

MH2 could broadcast a message stating, "If MH1, MH2, or MH4 hears this, then respond with your name." But that message

contains addresses of the recipients.

Thus, Applicant again submits that, if claim 1(a) is said to be found in Perkins, then that necessarily indicates that Perkins is using addresses (or "stated destinations"), contrary to the PTO's previous assertion.

Claim 2

Claim 2 is considered patentable, based on its parent claim 1.

Claim 5

Amended claim 5 states that attempts are made to send and receive packets. That is not seen in Perkins.

Claim 6

Claim 6(b) recites:

> b) at each neighbor,
>
> i) storing the message if the neighbor does not know of the change; and
>
> ii) transmitting the message to neighbors of the neighbor.

Applicant submits that this is not found in Perkins. As explained above, it appears that each message stops at its intended address. Thus, claim 6(b)(ii) is absent.

An MH may receive a message intended for another MH, wherein the former, in effect, passes the message along. However, that message is not stored in the former address, contrary to claim 6(a). Thus, if claim 6(b)(ii) is present for this reason, then claim 6(b)(i) is absent.

Claim 7

Claim 7 is considered patentable, based on its parent claim 6.

Claim 8

Claim 8 recites decrementing an age contained in the message. The Office Action relies on Perkins, column 7, lines 27 - 29 to show this. However, that passage discusses

1) assigning a metric of infinity to a link which is discovered to be broken and

2) assigning a timestamp to that event.

That does not show decermenting an age contained in a message. One reason is that no previous message existed. Any message is created upon discovery of the broken link.

The Office Action also relies on Perkins, column 5, lines 19 - 27. However, that passage only refers to replacing data in a routing table. That data includes a timestamp. Thus, "old" data-plus-timestamp is replaced by "new" data-plus-timestamp. That does

not show decrementing an age in a message. One reason is that the "new" timestamp will be a larger number than the "old" one: time increases as history moves forward. That replacement is not "decrementing."

Another reason is that the "new" stamp is inserted into a routing table. Even if replacement of the old timestamp is considered "decrementing," the routing table is not a "message." No "age" in a "message" is "decremented."

Claim 9

Claim 9 recites:

> 9. Method according to claim 8, wherein the neighbors of the neighbor further decrement the age.

This is not found in Perkins. The "timestamp" in Perkins is the time of creation of the message. There is no reason to modify that information, as in claim 9. Why would neighbors alter the time-of-creation of the data, when Perkins uses the time-of-creation for important purposes, such as determining when to replace old data by new data ?

In Applicant's invention, one purpose of the decrementing is to determin the age, in "hops," of a message. One purpose of that is to discard messages when they reach a certain age. Applicant can find no corresponding type of age in Perkins.

Claim 10

Claim 10 recites:

> 10. Method according to claim 6, wherein the neighbor of paragraph (b) discards the message if the neighbor has previously received the message.

The passage relied on by the PTO to show claim 10 refers to replacing existing stored messages with messages having later time stamps. That does not show claim 10. In Perkins, receiving a message having a later time stamp causes the new message to replace the old message. That is not discarding "the (new) message if the neighbor has previously received the message" as claimed. In fact, in Perkins, message content is irrelevant. It is the **timestamp** which causes the discard.

Further, the Office Action is looking at the **wrong message.** Claim 10 states that the **new** message is discarded. In Perkins, a **stored** message is discarded (if a later timestamp is received).

Claim 11

Claim 11 recites generation of "a message," and "propagating the message, until all nodes have received the message." As explained above, Perkins does not do that. Perkins generates

multiple messages (not "a" message), each addressed to an individual mobile host.

Claim 12

Claim 12 is considered patentable, based on its parent claim 11.

Also, claim 12 states that the "steps which cause termination of propagation" of claim 11 include "replacing the message with a newer message." Applicant requests that such replacement be shown in Perkins.

Claim 13

Applicant requests that the "rules" of claim 13 be identified in Perkins. Applicant cannot locate the rules in the passages on which the PTO relies on page 2 of the Office Action.

Claim 14

Claim 14 recites:

> 14. Method according to claim 5, wherein the nodes of paragraph (c) include nodes which originated the propagating reports.

The Office Action, at no place, appears to identify no location where Perkins shows this recitation. MPEP § 2131 states:

> A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.

Claim 15

Claim 15 recites:

> 15. Method according to claim 1, wherein the self-propagating messages lack stated destinations.

The discussion above shows that Perkins' messages are contrary to this recitation. Perkins has stated destinations.

Claims 16 - 19 and 22(c)

Claim 16 recites:

> 16. Method according to claim 1, wherein at least some propagating packets return to the node originating them.

Applicant requests that this recitation be shown in Perkins. One reason is that no reason appears why Perkins would need this. The originating node already knows the information in the packets, so why should they return to that node ? (Under the invention, they return because they are part of a flood which eventually dies out.)

This applies to claims 17 - 19 and 22(c).

Claim 20

Claim 20 recites:

> 20. Method according to claim 5, wherein reports continue to propagate after all nodes have received them.

Applicant submits that this cannot be found in Perkins. As explained above, a message in Perkins contains the address of its destination. When the message gets there, it stops.

Thus, how can messages "continue to propagate after all nodes have received them" as in claim 20 ?

Claims 21 and 22

The discussion of claim 1 applies to claims 21 and 22.

Added Claims 31 - 33

Support for these claims is contained in the Specification, page 3, section entitled "Overview," second paragraph.

The repeated copying of the messages is not found in Perkins.

Conclusion

Applicant requests that the rejections to the claims be reconsidered and withdrawn.

Applicant expresses thanks to the Examiner for the careful consideration given to this case.

Respectfully submitted,

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